

ABSTRACT

A method and apparatus for designing, monitoring or evaluating the growth of a subterranean hydraulic fracturing procedure is disclosed. The method uses techniques of analysis that are both accurate and efficient in reducing computing resources needed to process data. A computer generated method of estimation is used to determine the dimensions and shape of the hydraulic fracture. The estimate facilitates subsequent changes in fracturing parameter selection and design to maximize well performance and production. A rigorous method of evaluation is disclosed for a multi-layered or laminated petroleum reservoir. Material balance of hydraulically pumped fluids and proppant is maintained. In addition, the energy balance between the hydraulic fracture tip and the surrounding reservoir host rock is conserved.